The Nature Conservancy

Protecting nature. Preserving life.

SETTING THE FOUNDATION AND RESTORING OYSTER HABITAT IN FLORIDA'S PANHANDLE

Funding from the Deepwater Horizon Oil Spill settlement offers a unique opportunity to reverse the decline of Florida oyster populations and re-establish sustainable stocks of oysters across the Panhandle region for their ecological and market values. To achieve this end, The Nature Conservancy (TNC) proposes the State seek funds to engage a diversity of community stakeholders in an integrated, collaborative approach for the recovery of oyster resources with implementation of restoration as the end objective. The overall proposed approach to restoring oyster populations is the co-development of stakeholder engagement, filling data gaps and science-based goal setting followed by strategic in-water project implementation and monitoring.

The project includes four phases: (1) map existing reefs and assess their condition, (2) model oyster habitat suitability, (3) use these products to develop estuary-scale, stakeholder-driven ecosystem-based oyster management plans to serve as oyster recovery roadmaps and (4) implement one restoration project per bay as prioritized through the planning process. Phases 1-3 can be implemented simultaneously and are essential elements for implementing Phase 4. All 4 phases are identified by the State in the Oyster Integrated Mapping and Monitoring Report as recommendations needed to restore oyster habitat in Florida's Northwest Florida region. The Florida NRDA Oyster TIG prioritizes the first 3 phases of this project. The maps, models, restoration plans, and in-water restoration projects will serve as catalysts to kick-start the recovery of Panhandle oysters while leveraging and guiding future restoration. Funding for this project may come from DWH RESTORE, NRDA, NFWF-GEBF or other sources.

The Panhandle Bays that will be included in this project are shown in Figure 1 and the project phases are described in Table 1, see following page. Please note that the project does not include Pensacola East and Blackwater Bays, or Apalachicola Bay, because the project phases listed have either been completed or are currently funded and underway by TNC and FSU respectively. St Joseph Bay was also excluded from the project proposal due to the lack of historic oyster reef and suitable salinity ranges for oysters. For the purposes of this project, the Pensacola Bay System is defined as Escambia and Pensacola Bays (Escambia County) and Blackwater and East Bays (Santa Rosa County).

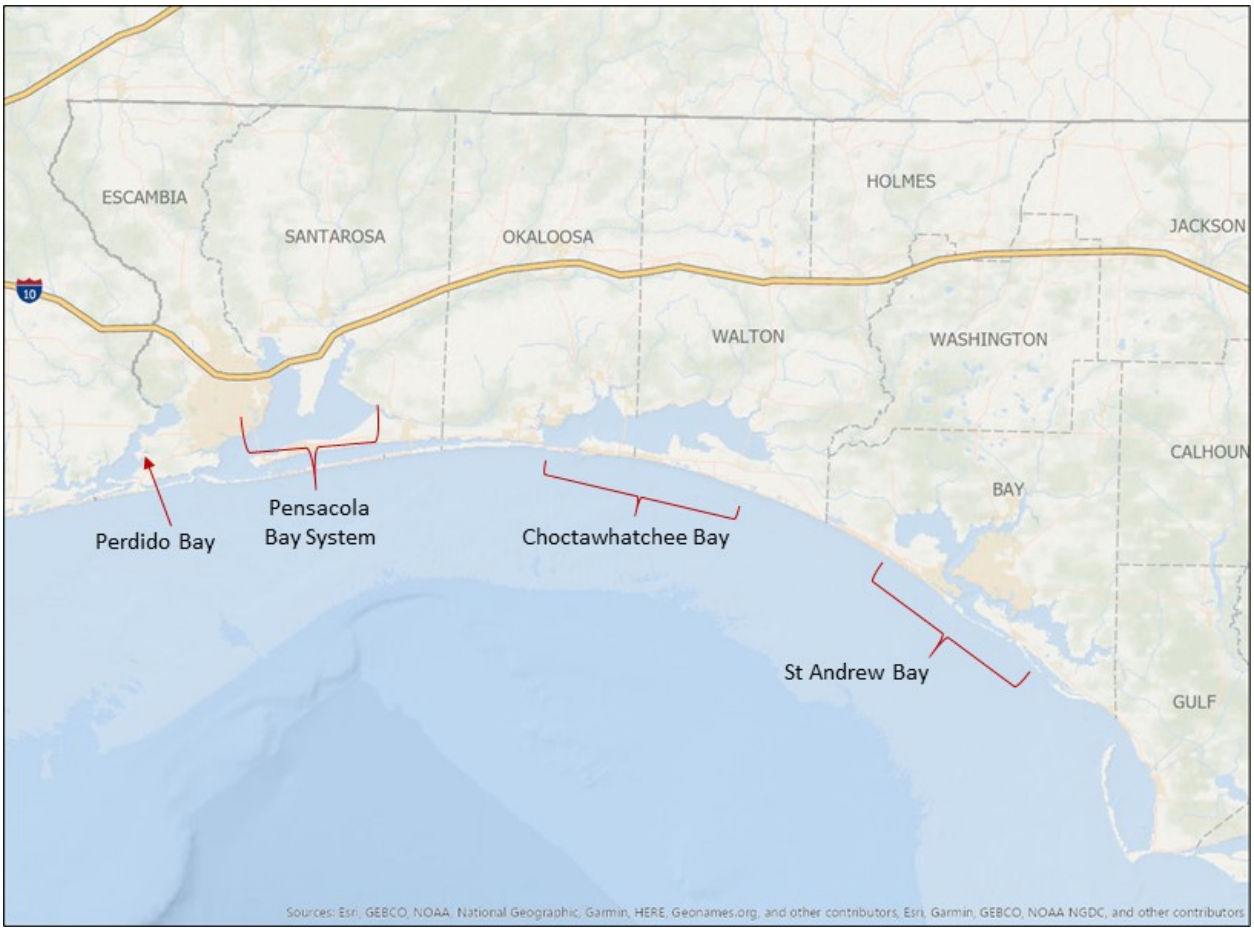

Figure 1. Project location by Bay

Table 1. Proposed Project Phases by Bay (indicated by an X)				
	Phase 1	**Phase 2**	**Phase 3**	**Phase 4**
	Oyster Mapping & Condition Analysis	**Oyster Habitat Suitability Model**	**Ecosystem-Based Oyster Management Plan**	**Oyster Habitat Restoration Project**
Perdido Bay*	X	funds not requested at this time	funds not requested at this time	funds not requested at this time
Pensacola Bay System	X Escambia & Pensacola Bay only	Developed by TNC in Sept. 2019	In progress, sponsored by TNC	X
Choctawhatchee Bay	X	X	X	X
St. Andrew Bay	X	X	X	X

*Mapping the FL portion only. If approved for funding, consider coordination with AL partners to identify funds to map the entire Bay and to implement the additional project phases for Perdido Bay.

Project Phases

The project phases for each bay can be implemented separately and do not necessarily need to be implemented in the order they are presented. However, if funding permits, the preference is to initiate Phases 1-3 simultaneously or in close succession so that the phases can inform each other. All elements should be coordinated with ongoing efforts by oyster researchers and restoration groups and involve a diverse group of stakeholders in each of the bay systems.

Phase 1 Oyster Mapping & Condition Analysis (1-year duration)

This phase involves assessing and compiling existing spatial data for oysters in the Florida Panhandle estuaries. A key data source is the maps compiled for the state's Oyster Integrated Mapping and Modeling Program (OIMMP). This will determine the extent of additional mapping needed to develop a full picture of the areal extent of oyster habitat in each bay. Methodologies used to map the intertidal and subtidal reefs will be based on best available science and the characteristics of each bay system. Lessons learned from other mapping efforts will be applied, including those conducted by Dr. Grizzle in Apalachicola Bay for TNC and TNC's current project funded through a Santa Rosa County RESTORE grant to conduct oyster mapping and condition analysis of reefs in the county's East Bay and Blackwater Bay. It is also important to collect and incorporate local knowledge from oyster fishermen into the areas prioritized for mapping. The results of the mapping and condition analysis will provide reef location, shape and size, live oyster density, and oyster size. Products for each bay should include a comprehensive analysis of oyster reef habitat, an ArcMap showing the location and spatial extent of all mapped reefs and a final report. All project activities should be fully coordinated with ongoing oyster research and management activities in the area to maximize use of the resulting data. The data can also be incorporated into the coastal resilience program managed by TNC (http://coastalresilience.org/).

Phase 2 Oyster Habitat Suitability Model (1-year duration)

Phase 2 is development of a GIS-based oyster habitat suitability model (OHSM) that rates the suitability of all estuarine areas within Choctawhatchee Bay and St. Andrew Bay for the potential for oyster reef restoration, oyster wild harvest fishery and oyster aquaculture. The product includes a report describing the process and underlying assumptions used for the model and model outputs. The analysis should evaluate biophysical and socioeconomic factors including but not limited to salinity, water depth, sediment type, benthic conditions, larval distribution, managed areas, preserves and navigation channels. Spatial data showing existing and historic oyster reefs should also be incorporated into the suitability analysis (from Phase 1). The factors should be evaluated with respect to availability of spatial data, quality of the data, age of the data, and relevance for model development. In addition to rating the suitability of feasible areas, areas that are not feasible should also be identified. Areas that are not feasible may include those with regulatory constraints, sediment contamination, or other factors. The preliminary suitability maps should be reviewed with stakeholders in each bay to gather

feedback on initial findings and adjust the suitability maps based on stakeholder feedback. The final oyster habitat suitability models results can be displayed on the Coastal Resilience and Freshwater Network decision support tools (http://coastalresilience.org/ and http://freshwaternetwork.org/, respectively) for use by stakeholders in restoration planning.

Phase 3 Ecosystem-Based Oyster Management Plans (2-year duration)

Phase 3 is the development of ecosystem-based oyster management (EBOM) plans for the Choctawhatchee and St Andrew Bay estuaries. The plans will establish an integrative science-based management scheme for restoration of oyster habitat (e.g., results of mapping and OHSM) and that includes goals for both oyster production to sustain wild oyster harvest, and aquaculture fisheries. Creating plans with achievable goals for restoration and management of oyster resources will require participation by fisheries interests, scientists, representatives of local, state and federal agencies and local communities. Similar plans are currently being developed for the Pensacola Bay System (TNC led) and Apalachicola Bay (FSU led). Both planning efforts have multiple diverse stakeholder interests at their tables, including the state agencies (FWC, FDEP and FDACS). These plans can serve as models for the Choctawhatchee Bay and St. Andrew Bay where Estuary Programs are now being established and the programs' leaders have expressed the desire to bring this type of EBOM planning to their bay systems.

Phase 4 Oyster Habitat Restoration Projects (5-year duration, including monitoring)

Implementation not only comprises the bulk of the budget but is also the focal point of this project. Phases 1-3 will help identify oyster reef restoration locations and methodologies in accordance with the recommendations outlined by the ecosystem-based oyster management plans. Projects will be designed, permitted and constructed in up to three Panhandle bay systems identified in Figure 1 above. A minimum of 1 year pre-restoration monitoring and 3 years, with a preferred option of 5 years, post-restoration monitoring is recommended to determine if goals are being met, and, if not, to propose solutions to improve performance and inform future goal-setting activities. In the Pensacola Bay System TNC has already developed an OHSM and is in the process of developing an EBOM plan guided by community stakeholders, which will allow for more immediate identification and implementation of oyster habitat restoration projects. The implementation funds are not meant to be sufficient to fully implement the EBOM plans for each bay, but rather serve as a catalyst to kick-start the recovery and guide future design and implementation of oyster habitat restoration projects.

Total Cost of Project

The project cost is estimated at $27,492,590 (Table 2) over 5 years. The budget will be refined as contractual estimates for the work are received. Estimates for oyster reef construction will be based on final permitted design. If there are economies of scale that are not included in the budget estimate for Phase 4, the project acres could be increased.

Table 2. Project Budget Estimate		
Project Phases	**FL Panhandle Bays Included**	**TOTAL**
Phase 1 - Oyster Mapping & Condition Analysis	Perdido, Escambia & Pensacola, Choctawhatchee and St. Andrew Bays	$3,190,215
Phase 2 - Oyster Habitat Suitability Models	Choctawahatchee Bay and St. Andrew Bay	$275,425
Phase 3 - Ecosystem-Based Oyster Management Plans	Choctawahatchee Bay and St. Andrew Bay	$742,900
Phase 4 - Oyster Habitat Restoration Projects	1 Project in each Bay - Pensacola Bay System, Choctawhatchee Bay and St. Andrew Bay	$23,284,050
Total Project Cost		**$27,492,590**

Summary

The project proposes engaging a wide range of stakeholders in an integrated, collaborative approach for the recovery of oyster resources across the Panhandle region. The overall approach to restoring oyster populations can be initiated and funded in phases but will ultimately result in oyster restoration and management plans for each bay followed by strategic in-water project implementation and monitoring in each bay system. With significant Deepwater Horizon Oil Spill settlement money still yet to be awarded, this is a once in a lifetime opportunity to reverse the oyster's decline in the Gulf, restore the habitat, ensure a robust, viable oyster fishering industry, and create healthier estuarine ecosystems across the Florida Panhandle.